

WHAT IS CLAIMED IS:

1       1. Fiberoptic sensing apparatus, comprising:  
2           a fiberoptic coupler in which a plurality of optical  
3       fibers are joined through a fused coupling region, said  
4       optical fibers including at least one input optical fiber and  
5       a plurality of output optical fibers, said fiberoptic coupler  
6       distributing light incident to said input optical fiber among  
7       said plurality of output optical fibers;  
8           a support member;  
9           said coupler being mounted to said support member and  
10      configured such that at least a portion of said coupling  
11      region can be deflected to change the light distribution among  
12      said output fibers without putting said coupling region under  
13      tension; and  
14           a fluid column cooperative with a deflection member  
15      disposed to deflect said portion of said coupling region.

1       2. The apparatus of Claim 1, further comprising:  
2           a transducer coupled to said fluid column, said  
3       transducer converting pressure fluctuations from an external

4 source into pressure changes in said fluid column, causing  
5 said deflection member to deflect said portion of said  
6 coupling region.

1       3. The apparatus of Claim 2, wherein said transducer is  
2 disposed at a first end of said fluid column, and said  
3 deflection member is disposed at a second end of said fluid  
4 column.

1       4. The apparatus of Claim 3, further comprising:  
2           a pressurizing device which sets an initial fluid  
3           pressure of said fluid column.

1       5. The apparatus of Claim 4, wherein said pressurizing  
2 device is connected to said fluid column at a position between  
3 said first and second ends.

1       6. The apparatus of Claim 1, wherein said fluid column  
2 is a liquid column.

1       7. The apparatus of Claim 1, wherein said fluid column  
2 is a gaseous column.

1       8. The apparatus of Claim 1, wherein at least part of  
2 said fluid column is contained in a hose.

1       9. The apparatus of Claim 2, wherein at least part of  
2 said fluid column is contained in a hose.

1       10. The apparatus of Claim 1, further comprising:  
2           a device optically coupled to said output optical fibers  
3 to detect the change of light distribution.

1       11. The apparatus of Claim 10, further comprising:  
2           a display connected to an output of said device.

1       12. An apparatus for monitoring acoustic activity or  
2 motion of an object, comprising:  
3           a support member having a surface configured to support  
4 the object;

5           a transducer associated with said support member and  
6 capable of transmitting pressure fluctuations due to acoustic  
7 activity or motion of the supported object;  
8           a fiberoptic sensor having a fused-fiber coupling region  
9 supported such that at least a portion of said coupling region  
10 can be deflected to change an output of said sensor without  
11 said coupling region being put under tension; and  
12           a fluid column coupled to said transducer and cooperative  
13 with a deflection member to transmit pressure fluctuations  
14 from said transducer to said deflection member, said  
15 deflection member deflecting said portion of said coupling  
16 region.

1           13. The apparatus of Claim 12, wherein said transducer  
2 is disposed at a first end of said fluid column, and said  
3 deflection member is disposed at a second end of said fluid  
4 column.

1           14. The apparatus of Claim 12, wherein at least a  
2 portion of said fluid column is contained in a hose.

1        15. The apparatus of Claim 12, wherein said transducer  
2    includes a bladder having an interior space in communication  
3    with said fluid column.

1        16. The apparatus of Claim 15, wherein said bladder has  
2    a resiliently deformable portion which transmits external  
3    pressure fluctuations to said interior space.

1        17. The apparatus of Claim 12, wherein said support  
2    member has a recessed or cut-out portion in which at least a  
3    portion of said transducer is received.

1        18. The apparatus of Claim 17, wherein said transducer  
2    includes a bladder, a portion of which protrudes from said  
3    surface of said support member to engage the object to be  
4    monitored.

1        19. The apparatus of Claim 18, wherein at least a  
2    portion of said fluid column is contained in a hose.

1           20. The apparatus of Claim 19, wherein said support  
2 member has a recessed or cut-out portion in which at least a  
3 portion of said hose is received.

1           21. The apparatus of Claim 12, further comprising:  
2           a device optically coupled to said fiberoptic sensor to  
3 detect output changes of said sensor due to the deflection of  
4 said portion of said coupling region.

1           22. The apparatus of Claim 21, further comprising a  
2 display connected to an output of said device